

MIXED FLOCK COUNTING

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asst. to Dr. Moynihan

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I. Field Notes.

1. Notes for Chiriquí trip.

Middle Area: area where there were many Brown Caps. Same as the Bend in Road Area. Everything else seems to be clear.

2- Notes for Ecuador Trip.
useless.

3- Notes for Tinamou Ontogeny
everything seems to be clear.

II. Data Sheets.

1. There were 15 different counts.

Clearing

a. Oct. 26 thru Nov. 9, 1959--~~regular~~ regular count, before the number system of reaction notation.

b. Nov. 10 thru Nov. 26, 1959--Clearing regular count, with the number system of reaction notation.

c. Nov. 27 thru Nov. 28--Clearing Behavioural Count in the tanager flocks.

d. Nov. 30 thru Dec. 1--Frijoles regular count.

e. Dec. 2 thru Dec. 15--Clearing Regular Count.

f. Dec. 19--Behavioral Count, in the Honeycreeper flocks.

g. Dec. 21 thru Dec. 23--Guayacon Honeycreeper count.

h. Dec. 30 thru Jan. 19--Frijoles regular count.

i. March 23 thru March 29--Chiriquí regular count, various subareas.

j. Apr. 12 thru Apr. 13--Portobelo regular count.

k. Jan. 7--thru Feb. 19--Seedeater count. In envelope.

also:

1. Dec. 9 thru Dec. 11--special count: "When DF followed Palms."
see summary envelope for Dec. 11.

ii. m. Dec. 12 thru Dec. 18--special count: "When DF followed ~~Palms~~." see summary envelope for Dec. 18.

n. Nov. 25--Naval Reservation, Gambca, count.

o. Dec. 16 thru Dec. 18--Clearing regular count, Honeycreeper flocks. See summary envelope for Dec. 18.

III. Terminology.

As a rule, one term came to be used for each idea in the counting, but there are many exceptions. Some of the ideas have several terms or variations on the term evolved through usage or changed intentionally.

1. Mixed Flocks.

A mixed flock is two or more species in an association either in the same actual tree or in the same volume composed roughly of a sphere fifty feet in diameter., incases where there are no natural foliage breaks.

2. Nucleus of a Flock.

Blue joins plain
An old term, originally used to mean a species which was joined by the other species of a given mixed flock. Later more definite observation changed this term to mean one species joining another to form a mixed flock when the original species was by itself previously, or when one species joins another species within ten feet. Notation, e.g.: "1. Blue j. Plain--a reaction which was summarized in: "nucleus of flocks" summaries, "joining" summaries, and "following and/or joining" summaries.

2. Group Leader

Blue follows plain
A now completely obsolete term used only when the first bird in a flight of a mixed flock was identified. This term is virtually replaced by the "following" term or reaction, once the observer becomes profficient at rapid identification. Notation, e.g.: 2. Gold.

3. Following

When one species actually follows another within thirty seconds in flight, wither from tree to tree or from branch to branch in the same tree--provided the individuals do not appear aggressive to one another. Notation, e.g.: 3. Blue f. Plain.

4. Not Following

When one species leaves a mixed flock conspicuously, without being followed by any other species. Distinguished from "leaving" by the fact that the Bird flies giving some call notes. Notation, e.g.: 4. Palm.

5. Supplanting

When one species takes the perch of, or lands close to and causes the

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escape of,--another species, in an obviously hostile manner. Notation,
e.g.: 5. Green → RH.

6. Leaving.

When one species leaves a mixed flock inconspicuously, i.e., completely silently--without being followed by any other species. Notation,
e.g.: 6. Plain.

7. Intraspecific Contact Fight.

Notation, e.g.: 7. Bananaquit.

8. Abbreviations.

mitrosph-Mitrosphingus sp.
or. bill spar.-Orange Billed Sparrow
Buffthr.-Buff-throated Saltator
BTS- " " "
Black Cap S.-Black-capped Saltator
BCS- " " "
RLH-Red-legged Honeycreeper
YLH/Yellow-legged Blue Honeycreeper
BDac-Blue Dacnis
SDac-Scarlet-thighed Dacnis
YTO-Yellow-tailed Oriole
Y.T.O. " " "
BTO-Black-tailed Oriole
B.T.O. " " "
Variab.-Variable Seedeater
VS- " "
Wltan-White-lined Tanager
BB-Blue-black Grassquit
BBGrass. " " "
Ban.-Bananaquit
YW-Yellow Warbler
F.V.U.-Fulvous-vented Euphonia
Mask-Masked Tityra
CSW-Chestnut-sided Warbler
YB-Yellow-bellied Seedeater

IV. Field Techniques

1. Clearing Regular Count
Regular Count
Old Style Count

This type of count was made by walking around the clearing from the end of the dock to behind the library and over to ZMA, looking for flocks mainly by eye, also by ear, almost never by actual scanning with glasses. When every bird of a given flock had been counted, and the reactions that had taken place during the counting were notated, I moved on to another area and looked for other flocks. No longer than ten to fifteen minutes was spent at one flock-at the most--before moving on. I never counted the same flock more than once within a half hour.

2. Clearing Behavioral Count
Behavioral Count
New Style Count

This count was made in the same way as the Regular count, only much more time was spent on each mixed flock in order to observe as many reactions as possible. Occasionally an entire hour was spent with one mixed flock.

3. Guayacon Honeycreeper Count

This was made solely in two trees in the clearing, one of which has been chopped down. I sat and watched the flock in it steadily for four hours in the morning, recounting the contents not more than every fifteen to twenty minutes. Reactions were observed and notated continually, however.

4. Miscellaneous "Regular Counts"

These counts were done as closely similar to Clearing Regular Counts as the conditions permitted, i.e., time spent on each flock, time between re-counts, etc.

5. Seedeater Count

This count was made, as is described in the field notes in the envelope, in one small location, where I remained for the entire period of observation. Circulation proved unsuccessful, as the species were too shy and reacted to me at less than seventy feet. Models were always used.

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TABLE 1.

Mixed Flocks above Urdunavi, Northern Bolivia,
October-November, 1963.

Hours of observation: $42\frac{1}{2}$. *

Average no. of individuals seen per hour: 8.94.

Average no. of individuals seen in mixed flocks per hour: 5.41.

Individuals seen in mixed flocks as % of relevant total no.
of individuals seen: 63.89%.

Average no. of mixed flocks seen per hour: 0.94

Average no. of highly organized mixed flocks seen per hour: 0.61. **

Average no. of individuals per mixed flock: 5.75.

Largest no. of individuals in one flock: 15.

Average no. of species per mixed flock (based on 36 flocks in
this case): 3.53.

Largest no. of species in one flock: 8.

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TABLE 2.

Mixed Flocks above Urdunavi, Northern Bolivia,
February - March, 1964.

Hours of observation: $23 \frac{1}{2}$.

Average no. of individuals seen per hour: 7.85.

Average no. of individuals seen in mixed flocks per hour: 5.74.

Individuals seen in mixed flocks as % of relevant total no.
of individuals seen: 73.52%.

Average no. of mixed flocks seen per hour: 0.94.

Average no. of highly organized mixed flocks seen per hour: 0.76.

Average no. of individuals per mixed flock: 6.14.

Largest no. of individuals in one flock: 20.

Average no. of species per mixed flock: 3.91.

Largest no. of species in one flock: 12.

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TABLE 3.

Mixed Flocks below Indhuari, Northern Bolivia,
October - November, 1963.

Hours of observation: $19 \frac{3}{4}$.

Average no. of individuals seen per hour: 17.90.

Average no. of individuals seen in mixed flocks per hour: 1.87.

Individuals seen in mixed flocks as % of relevant total no.
of individuals seen: 23.72 %.

Average no. of mixed flocks seen per hour: 0.51.

Average no. of highly organized mixed flocks seen per hour: 0.05.

Average no. of individuals per mixed flock: 3.70.

Largest no. of individuals in one flock: 8.

Average no. of species per mixed flock: 2.50.

Largest no. of species in one flock: 5.

TABLE 4.

Mixed Flocks below Induavi, Northern Bolivia,
February-March, 1964.

Hours of observation: $10\frac{1}{4}$.

Average no. of individuals seen per hour: 10.34.

Average no. of individuals seen in mixed flocks per hour: 6.44.

Individuals seen in mixed flocks as % of relevant total no.
of individuals seen: 62.26 %.

Average no. of mixed flocks seen per hour: 1.17.

Average no. of highly organized mixed flocks seen per hour: 0.78.

Average no. of individuals per mixed flock: 5.50.

Largest no. of individuals in one flock: 11.

Average no. of species per mixed flock: 2.92.

Largest no. of species in one flock: 5.

TABLE 5.

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Mixed Flocks at the Top and on the Eastern and
Southeastern Slopes of Machu Picchu.

(Most data from June, 1966; a few counts from February, 1964).

Hours of observation: 35.

Average no. of individuals seen per hour: 9.43

Average no. of individuals seen in mixed flocks per hour: 7.83.

Individuals seen in mixed flocks as % of ~~relevant~~ total no.
of individuals seen: 83.03%

Average no. of mixed flocks seen per hour: 0.94.

Average no. of highly organized mixed flocks seen per hour: 0.63.

Average no. of individuals per mixed flock: 8.06.

Largest no. of individuals in one flock: 24.

Average no. of species per mixed flock: 5.24.

Largest no. of species in one flock: 20.

TABLE G.

Mixed Flocks on the Western and
Northwestern Slopes of Maclean Picnic, February, 1964.

Hours of observation: $27\frac{1}{2}$.

Average no. of individuals seen per hour: 3.13.

Average no. of individuals seen in mixed flocks per hour: 0.73

Individuals seen in mixed flocks as % of ~~relevant~~ total no.
of individuals seen: 23.26%

Average no. of mixed flocks seen per hour: 0.22

Average no. of highly organized mixed flocks seen per hour: 0.11

Average no. of individuals seen per mixed flock: 3.33

Largest no. of individuals in one flock: 4.

Average no. of species per mixed flock: 2.50.

Largest no. of species in one flock: 4.

TABLE 7.

Mixed Flocks on the Western and
Northwestern Slopes of Machin Picchu, June, 1966.

Hours of observation: 21.

Average no. of individuals seen per hour: 4.38.

Average no. of individuals seen in mixed flocks per hour: 1.90

Individuals seen in mixed flocks as % of ~~relevant~~ total no.
of individuals seen: 41.30%

Average no. of mixed flocks seen per hour: 0.29

Average no. of highly organized mixed flocks seen per hour: 0.10

Average no. of individuals seen per mixed flock: 6.33.

Largest no. of individuals in one flock: 8.

Average no. of species per mixed flock: 4.17.

Largest no. of species in one flock: 6.

TABLE 8.

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Mixed Flocks at Carpush Pass, May, 1966.

Hours of observation: 25.

Average no. of individuals seen per hour: 13.00

Average no. of individuals seen in mixed flocks per hour: 9.44

Individuals seen in mixed flocks as % of total no. of individuals seen: 72.62%

Average no. of mixed flocks seen per hour: 1.04

Average no. of highly organized mixed flocks seen per hour: 0.64

Average no. of individuals seen per mixed flock: 9.08

Largest no. of individuals in one flock: 23.

Average no. of species per mixed flock: 3.44

Largest no. of species in one flock: 17.

TABLE 9.

Mixed Flocks near Panao, May, 1966.

Hours of observation: 10.

Average no. of individuals seen per hour: 6.40.

Average no. of individuals seen in mixed flocks per hour: 1.50

Individuals seen in mixed flocks as % of total no. of individuals seen: 23.44

Average no. of mixed flocks seen per hour: 0.40

Average no. of highly organized mixed flocks seen per hour: 0.10

Average no. of individuals seen per mixed flock: 3.75

Largest no. of individuals in one flock: 7

Average no. of species per mixed flock: 2.75

Largest no. of species in one flock: 4

TABLE 10.

Birds of the Palca Area, February, 1964

Hours of observation: $17 \frac{1}{2}$

Average no. of individuals seen per hour: 4.51

Average no. of individuals seen in flocks per hour: 0

TABLE II.

Mixed Flocks near Chachapoyas February 1964

Hours of observation: 13

Average no. of individuals seen per hour: 5.38

Average no. of individuals seen in mixed flocks per hour: 0.69

Individuals seen in mixed flocks as % of total no. of
individuals seen: 12.86%

Average no. of mixed flocks seen per hour: 0.23

Average no. of highly organized mixed flocks seen per hour: 0

Average no. of individuals seen per mixed flock: 3

Largest no. of individuals in one flock: 5

Average no. of species per mixed flock: 2.33

Largest no. of species in one flock: 3

TABLE 12

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Mixed flocks near Cienega, June 1966

Hours of observation: 17

Average no. of individuals seen per hour: 6.41

Average no. of individuals seen in mixed flocks per hour: 3.94

Individuals seen in mixed flocks as % of total no. of individuals seen: 61.47

Average no. of mixed flocks seen per hour: 0.76

Average no. of highly organized mixed flocks seen per hour: 0.47

Average no. of individuals seen per mixed flock: 5.15

Largest no. of individuals in one flock: 13

Average no. of species per mixed flock: 3.62

Largest no. of species in one flock: 8

TABLE 13

Central Ecuador, All Areas Apparently Suitable for Flocks,
1964 and 1966

- Hours of observation: 111
Average no. of individuals seen per hour: 11.96
Average no. of individuals seen in mixed flocks per hour: 4.35
Individuals seen in mixed flocks as % of total no. of
individuals seen: 36.37%
Average no. of mixed flocks seen per hour: 0.80
Average no. of highly organized mixed flocks seen per hour: 0.31
Average no. of individuals seen per mixed flock: 5.43
Largest no. of individuals in one flock: 17
Average no. of species per mixed flock: 3.38
Largest no. of species in one flock: 10

TABLE 14

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Central Ecuador; Areas in which Highly Organized Flocks
Were Seen, 1964 and 1966

Hours of observation: 62 $\frac{3}{4}$

Average no. of individuals seen per hour: 14.49

Average no. of individuals seen in mixed flocks per hour: 6.96

Individuals seen in mixed flocks as % of total no. of
individuals seen: 48.04 %

Average no. of mixed flocks seen per hour: 1.16

Average no. of highly organized mixed flocks seen per hour: 0.54

Average no. of individuals seen per mixed flock: 5.99

Largest no. of individuals in one flock: 17

Average no. of species per flock: 3.66

Largest no. of species in one flock: 10

TABLE 15

Central Ecuador; Apparently Suitable Areas in which
Highly Organized Flocks Were Not Seen, 1964 and 1966.

Hours of observation: $48\frac{1}{4}$

Average no. of individuals seen per hour: 8.67

Average no. of individuals seen in mixed flocks per hour: 0.75

Individuals seen in mixed flocks as % of total no. of
individuals seen: 12.33 %

Average no. of mixed flocks seen per hour: 0.33

Average no. of highly organized mixed flocks seen per hour: 0

Average no. of individuals seen per mixed flock: 2.88

Largest no. of individuals in one flock: 4

Average no. of species per flock: 2.13

Largest no. of species in one flock: 3

TABLE 16

Mixed Flocks Along Road to Santo Domingo,
ca. 2957-2833 m., March, 1966

Hours of observation: 14

Average no. of individuals seen per hour: 17.21

Average no. of individuals seen in mixed flocks per hour: 8.86

Individuals seen in mixed flocks as % of total no. of
individuals seen: 51.45 %

Average no. of mixed flocks seen per hour: 1.50

Average no. of highly organized mixed flocks seen per hour: 0.64

Average no. of individuals seen per mixed flock: 5.90

Largest no. of individuals in one flock: 15

Average no. of species per mixed flock: 3.67

Largest no. of species in one flock: 10

TABLE 17

Mixed Flocks Along Road to Santa Dominga,
ca. 2805-2683m., March, 1966.

Hours of observation: 14 1/2

Average no. of individuals seen per hour: 15.03

Average no. of individuals seen in mixed flocks per hour: 8.62

Individuals seen in mixed flocks as % of total no. of
individuals seen: 57.34%

Average no. of mixed flocks seen per hour: 1.31

Average no. of highly organized mixed flocks seen per hour: 0.41

Average no. of individuals seen per mixed flock: 6.58

Largest no. of individuals in one flock: 117

Average no. of species per mixed flock: 4.0

Largest no. of species in one flock: 10

TABLE 18

Mixed Flocks at Quana, September, 1962

Hours of observation: $10 \frac{3}{4}$

Average no. of individuals seen per hour: 6.79

Average no. of individuals seen in mixed flocks per hour: 3.26

Individuals seen in mixed flocks as % of total no. of individuals seen: 47.95%

Average no. of mixed flocks seen per hour: 0.37

Average no. of high organized mixed flocks seen per hour: 0.28

Average no. of individuals seen per mixed flock: 8.175

Largest no. of individuals in one flock: 16

Average no. of species per mixed flock: 5.50

Largest no. of species in one flock: 9

TABLE 19

Mixed Flocks at Quasa, April, 1965

Hours of observation: $13\frac{1}{2}$

Average no. of individuals seen per hour: 12.81

Average no. of individuals seen in mixed flocks per hour: 4.81

Individuals seen in mixed flocks as % of total no. of individuals seen: 37.51%

Average no. of mixed flocks seen per hour: 0.75

Average no. of highly organized mixed flocks seen per hour: 0.30

Average no. of individuals seen per mixed flock: 6.50

Largest no. of individuals in one flock: 12

Average no. of species per mixed flock: 4.10

Largest no. of species in one flock: 6

TABLE 20

Mixed Flocks at Guasca, August, 1963

Hours of observation: $7\frac{1}{4}$

Average no. of individuals seen per hour: 10.48

Average no. of individuals seen in mixed flocks per hour: 2.07

Individuals seen in mixed flocks as % of total no. of individuals seen: 19.74 %

Average no. of mixed flocks seen per hour: 0.41

Average no. of highly organized mixed flocks seen per hour: 0.14

Average no. of individuals seen per mixed flock: 5

Largest no. of individuals in one flock: 8

Average no. of species per mixed flock: 4.33

Largest no. of species in one flock: 7

TABLE 21

Mixed flocks on Mountains above Bogotá, April, 1965.

Hours of observation: 21 $\frac{3}{4}$

Average no. of individuals seen per hour: 9.22

Average no. of individuals seen in mixed flocks per hour: 2.85

Individuals seen in mixed flocks as % of total no. of individuals seen: 24.26 %

Average no. of mixed flocks seen per hour: 0.59

Average no. of highly organized mixed flocks seen per hour: 0.14

Average no. of individuals in one flock: 3.77

Largest no. of individuals in one flock: 17

Average no. of species per mixed flock: 2.77

Largest no. of species in one flock: 5

TABLE 22

Mixed Flocks on Mountains above Bogota, August, 1965

Hours of observation: $11\frac{1}{2}$

Average no. of individuals seen per hour: 12

Average no. of individuals seen in mixed flocks per hour: 4.52

Individuals seen in mixed flocks as % of total no. of individuals seen: 38.96%

Average no. of mixed flocks seen per hour: 0.87

Average no. of highly organized mixed flocks seen per hour: 0.52

Average no. of individuals in one flock: 5.10

Largest no. of individuals in one flock: 12

Average no. of species per mixed flock: 3.30

Largest no. of species in one flock: 8

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TABLE 23

Mixed Flocks at Agua Bonita, April, 1965

Hours of observation: $8\frac{1}{4}$

Average no. of individuals seen per hour: 8.24

Average no. of individuals seen in mixed flocks per hour: 4.97

Individuals seen in mixed flocks as % of total no. of individuals seen: 60.29 %

Average no. of mixed flocks seen per hour: 0.36

Average no. of highly organized mixed flocks seen per hour: 0.36

Average no. of individuals in one flock: 13.67

Largest no. of individuals in one flock: 26

Average no. of species per mixed flock: 8.67

Largest no. of species in one flock: 15

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TABE 24

Mixed Flocks at Agua Bonita, August, 1965

Hours of observation: 13

Average no. of individuals seen per hour: 13.23

Average no. of individuals seen in mixed flocks per hour: 9.31

Individuals seen in mixed flocks as % of total no. of individuals seen: 70.35 %

Average no. of mixed flocks seen per hour: 1.23

Average no. of highly organized flocks seen per hour: 0.85

Average no. of individuals in one flock: 7.56

Largest no. of individuals in one flock: 19

Average no. of species per mixed flock: 4.50

Largest no. of species in one flock: 11

TABLE 25

Mixed Flocks on Pico Espayo, April, 1965

Hours of observation: 23

Average no. of individuals seen per hour: 9.48

Average no. of individuals seen in mixed flocks per hour: 4.08

Individuals seen in mixed flocks as % of total no. of individuals seen: 43.12%

Average no. of mixed flocks seen per hour: 0.44

Average no. of highly organized mixed flocks seen per hour: 0.35

Average no. of individuals in one flock: 5.53

Largest no. of individuals in one flock: 16

Average no. of species per mixed flock: 4.06

Largest no. of species in one flock: 11

TABLE 26

Mixed Flocks on Pier Espeso, August-September, 1965

Hours of observation: $14\frac{1}{2}$

Average no. of individuals seen per hour: 9.17

Average no. of individuals seen in mixed flocks per hour: 4.24

Individuals seen in mixed flocks as % of total no. of individuals seen: 48.95%

Average no. of mixed flocks seen per hour: 0.46

Average no. of highly organized mixed flocks seen per hour: 0.46

Average no. of individuals in one flock: 9.53

Largest no. of individuals in one flock: 22

Average no. of species per mixed flock: 3.91

Largest no. of species in one flock: 15

TABLE 27

Mixed Flocks at La Playa, April, 1965

Hours of observation: $9\frac{3}{4}$

Average no. of individuals seen per hour: 8.31

Average no. of individuals seen in mixed flocks per hour: 2.87

Individuals seen in mixed flocks as % of total no. of individuals seen: 34.57%

Average no. of mixed flocks seen per hour: 0.61

Average no. of highly organized mixed flocks seen per hour: 0.31

Average no. of individuals in one flock: 4.67

Largest no. of individuals in one flock: 6

Average no. of species per mixed flock: 2

Largest no. of species in one flock: 2

TABLE 28

Mixed Flocks at La Negra, August - September, 1965

Hours of observation: $11\frac{1}{2}$

Average no. of individuals seen per hour: 13.04

Average no. of individuals seen in mixed flocks per hour: 5.91

Individuals seen in mixed flocks as % of total no. of individuals seen: 45.34%

Average no. of mixed flocks seen per hour: 0.96

Average no. of high organized mixed flocks seen per hour: 0.35

Average no. of individuals in one flock: 6.18

Largest no. of individuals in one flock: 15

Average no. of species per mixed flock: 3.25

Largest no. of species in one flock: 8

TABLE 29

Mixed Flocks at Zumbador, September, 1965

Hours of observation: $8\frac{1}{4}$

Average no. of individuals seen per hour: 18.06

Average no. of individuals seen in mixed flocks per hour: 15.03

Individuals seen in mixed flocks as % of total no. of individuals seen: 83.22%

Average no. of mixed flocks seen per hour: 1.07

Average no. of highly organized mixed flocks seen per hour: 1.07

Average no. of individuals in one flock: 13.78

Largest no. of individuals in one flock: 22

Average no. of species per mixed flock: 7.67

Largest no. of species in one flock: 11

TABLE 30

Mixed Flocks at San Lorenzo, August, 1964

Hours of observation: $33 \frac{3}{4}$

Average no. of individuals seen per hour: 7.36

Average no. of individuals seen in mixed flocks per hour: 6.49

Individuals seen in mixed flocks as % of total no. of individuals seen: 69.08%

Average no. of mixed flocks seen per hour: 0.83

Average no. of highly organized mixed flocks seen per hour: 0.44

Average no. of individuals in one flock: 17.82

Largest no. of individuals in one flock: 32 *

Average no. of species per mixed flock: 4.43

Largest no. of species in one flock: 14

* This flock included a particularly large group of individuals of Chlorophonia cyanea.

TABLE 31

Mixed flocks, Top and West (Papayan) Side, Puerto, May,
1965

Hours of observation: $49 \frac{3}{4}$

Average no. of individuals seen per hour: 8.56

Average no. of individuals seen in mixed flocks per hour: 4.02

Individuals seen in mixed flocks as % of total no. of
individuals seen: 46.95%

Average no. of mixed flocks seen per hour: 0.68

Average no. of highly organized mixed flocks seen per hour: 0.42

Average no. of individuals in one flock: 5.88

Largest no. of individuals in one flock: 18

Average no. of species per mixed flock: 3.91

Largest no. species in one flock: 10.

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TABLE 32

Mixed Flocks, Top and West (Papayán) Side, Pinar, August, 1965.

Hours of observation: 7

Average no. of individuals seen per hour: 9.71

Average no. of individuals seen in mixed flocks per hour: 7.14

Individuals seen in mixed flocks as % total no. of individuals seen: 73.53 %

Average no. of mixed flocks seen per hour: 0.57

Average no. of highly organized flocks seen per hour: 0.57

Average no. of individuals in one flock: 12.50

Largest no. of individuals in one flock: 22

Average no. of species per mixed flock: 2.25

Largest no. of species in one flock: 13

TABLE 33

Mixed Flocks, East (Morapan) Side, Pinnac, May 1965.

Hours of observation: $19 \frac{3}{4}$

Average no. of individuals seen per hour: 11.90

Average no. of individuals seen in mixed flocks per hour: 10.79

Individuals seen in mixed flocks as % total no. of individuals seen: 90.64%

Average no. of mixed flocks seen per hour: 0.91

Average no. of highly organized mixed flocks seen per hour: 0.81

Average no. of individuals in one flock: 11.83

Largest no. of individuals in one flock: 28

Average no. of species per mixed flock: 7.22

Largest no. of species in one flock: 16.

TABLE 34

Mixed Flocks, East (Mesopán) Side, Pinar, August, 1965

Hours of observation: 13

Average no. of individuals seen per hour: 17.77

Average no. of individuals seen in mixed flocks per hour: 16.38

Individuals seen in mixed flocks as % total no. of individuals seen: 92.21%

Average no. of mixed flocks seen per hour: 1.08

Average no. of highly organized mixed flocks seen per hour: 1.08

Average no. of individuals in one flock: 15.215

Largest no. of individuals in one flock: 35

Average no. of species per mixed flock: 9.36

Largest no. of species in one flock: 28

TABLE 35

Mixed Flocks in the Northern Part of the Central Cordillera
of Colombia, July 1965

Hours of observation: 23 1/2

Average no. of individuals seen per hour: 8.36

Average no. of individuals seen in mixed flocks per hour: 4.85

Individuals seen in mixed flocks as % total no. of
individuals seen: 58.16 %

Average no. of mixed flocks seen per hour: 0.64

Average no. of highly organized mixed flocks seen per hour: 0.55

Average no. of individuals in one flock: 7.60

Largest no. of individuals in one flock: 20

Average no. of species per mixed flock: 5.0

Largest no. of species in one flock: 16

TABLE 36

Mixed Flocks on Manichique in the Western Cordillera
of Colombia, May 1963

Hours of observation: $29\frac{1}{4}$

Average no. of individuals seen per hour: 8.85

Average no. of individuals seen in mixed flocks per hour: 5.47

Individuals seen in mixed flocks as % total no. of
individuals seen: 61.78%

Average no. of mixed flocks seen per hour: 0.72

Average no. of highly organized mixed flocks seen per hour: 0.48

Average no. of individuals in one flock: 7.62

Largest no. of individuals in one flock: 18

Average no. of species per mixed flock: 4.37

Largest no. of species in one flock: 13

TABLE 37

Mixed Flocks on Munchique in the Western Cordillera
of Colombia, August 1965

Hours of observation: 18

Average no. of individuals seen per hour: 10.06

Average no. of individuals seen in mixed flocks per hour: 8.56

Individuals seen in mixed flocks as % total no. of
individuals seen: 85.08%

Average no. of mixed flocks seen per hour: 0.61

Average no. of highly organized mixed flocks seen per hour: 0.56

Average no. of individuals in one flock: 14.0

Largest no. of individuals in one flock: 37

Average no. of species per mixed flock: 7.82

Largest no. of species in one flock: 19

TABLE 38

Mixed Flocks at San Gerardo-La Palma in the Western
Cordillera of Colombia, August 1965

Hours of observation: $9\frac{1}{4}$

Average no. of individuals seen per hour: 8.32

Average no. of individuals seen in mixed flocks per hour: 5.04

Individuals seen in mixed flocks as % total no. of
individuals seen: 61.04%

Average no. of mixed flocks seen per hour: 0.54

Average no. of highly organized mixed flocks seen per hour: 0.32

Average no. of individuals in one flock: 9.40

Largest no. of individuals in one flock: 20

Average no. of species per mixed flock: 5.0

Largest no. of species in one flock: 10

(21)

TABLE 39

Mixed Flocks near La Carpuentería in the Western
Cordillera of Colombia, April-May 1965

Hours of observation: 20 1/2

Average no. of individuals seen per hour: 8.15

Average no. of individuals seen in mixed flocks per hour: 6.88

Individuals seen in mixed flocks as % total no. of
individuals seen: 84.43%

Average no. of mixed flocks seen per hour: 0.68

Average no. of highly organized mixed flocks seen per hour: 0.68

Average no. of individuals in one flock: 10.08

Largest no. of individuals in one flock: 20

Average no. of species per mixed flock: 6.15

Largest no. of species in one flock: 13

TABLE 40

Mixed Flocks near La Carpentaria in the Western
Cordillera of Colombia, August 1965

Hours of observation: $14 \frac{1}{2}$ *

Average no. of individuals seen per hour: 11.17

Average no. of individuals seen in mixed flocks per hour: 10.76

Individuals seen in mixed flocks as % total no. of
individuals seen: 96.29%

Average no. of mixed flocks seen per hour: 1.10

Average no. of highly organized mixed flocks seen per hour: 1.04

Average no. of individuals in one flock: 9.73

Largest no. of individuals in one flock: 21

Average no. of species per mixed flock: 6.81

Largest no. of species in one flock: 15

* All observations were made in the afternoons, usually late, on
five different days.

✓
24

TABLE 41

Mixed Flocks in the Farallones in the Western
Cordillera of Colombia, May 1965

Hours of observation: $17\frac{1}{2}$

Average no. of individuals seen per hour: 14.40

Average no. of individuals seen in mixed flocks per hour: 11.49

Individuals seen in mixed flocks as % total no. of
individuals seen: 79.76%

Average no. of mixed flocks seen per hour: 1.26

Average no. of highly organized mixed flocks seen per hour: 0.91

Average no. of individuals in one flock: 9.14

Largest no. of individuals in one flock: 20

Average no. of species per mixed flock: 6.0

Largest no. of species in one flock: 13.

TABLE 42

Mixed Flocks in the Paramo Frontero Region of the Western
Cordillera of Colombia, July 1965

Hours of observation: 28

Average no. of individuals seen per hour: 10.61

Average no. of individuals seen in mixed flocks per hour: 7.78

Individuals seen in mixed flocks as % total no. of
individuals seen: 73.40%

Average no. of mixed flocks seen per hour: 0.86

Average no. of highly organized mixed flocks seen per hour: 0.32

Average no. of individuals in one flock: 9.08

Largest no. of individuals in one flock: 24

Average no. of species per mixed flock: 5.21 *

Largest no. of species in one flock: 14

* Based on 19 flocks

Northern Bolivia

①

SUM TOTAL: Above Induani 1963

Hours Spent = 42 1/2

Average no. inds. seen per hour = 8.94

Average no. inds. seen in flocks per hour = 5.41

Inds. seen in flocks as % total inds. = 63.89

Average no. flocks seen per hour = 0.94

Average no. highly organized flocks per hour = 0.61

Average no. inds. per flock = 5.75

Largest no. inds. in one flock = 15

Average no. species per flock = 3.53
(based on 36 flocks)

Largest no. species in one flock = 8

Northern Boobies

(2) ✓

SUM TOTAL - Above Unduave. 1964

Hours Spent = 23½

Average no. inds. seen per hour = 7.87

Average no. inds. seen in flocks per hour = 5.74

Inds. seen in flocks as % total inds. = 73.52%

Average no. flocks seen per hour = 0.94

Average no. highly organized flocks per hour = 0.76

Average no. inds. per flock = 6.14

Largest no. inds. in one flock = 20

Average no. species per flock = 3.91

Largest no. species in one flock = 12

Panama Area Peru

May, 1966 - Sum Total

Double checked

Hours Spent = 10

Average no. inds seen per hour = 6.40

Average no. inds seen in flocks per hour = 1.50

Inds. seen in flocks as % total inds. = 23.44 %

Average no. flocks seen per hour = 0.40

Average no. highly organized flocks per hour = 0.10

Average no. inds. per flock = 3.75

Largest no. inds. in one flock = 7

Average no. species per flock = 2.75

Largest no. species in one flock = 4

Carpenter's Area Peru

May, 1966 - Sum Total Double checked

Hours Spent = 2.5

Average no. inds. seen per hour = 13.00

Average no. inds. seen in flocks per hour = 9.44

Inds. seen in flocks as % total inds. = 72.62%

Average no. flocks seen per hour = 1.04

Average no. highly organized flocks per hour = 0.64

Average no. inds. per flock = 9.08

Largest no. inds. in one flock = 25

Average no. species per flock = 5.44
(based on 23 flocks)

Largest no. species in one flock = 17

Palea Area Pond
(Low and High)

February 1964 - Sum Total

Hours Spent = $17 \frac{1}{2}$ (All in areas without mixed flocks.)

Average no. inds. seen per hour = 4.51

Average no. inds. seen in flocks per hour = 0

Inds. seen in flocks as % total inds. = 0%

Average no. flocks seen per hour = 0

Average no. highly organized flocks per hour = 0

Average no. inds. per flock = 0

Largest no. inds. in one flock = 0

Average no. species per flock = 0

Largest no. species in one flock = 0

Northern Peru

SUM TOTAL: Chachapoyas - Hill above town, 1964

Hours Spent = 13

Average no. inds seen per hour = 5.38

Average no. inds seen in flocks per hour = 0.69

Inds. seen in flocks as % total inds. = 12.86 %

Average no. flocks seen per hour = 0.23

Average no. highly organized flocks per hour = 0

Average no. inds. per flock = 3.0

Largest no. inds. in one flock = 5

Average no. species per flock = 2.33

Largest no. species in one flock = 3

Extreme North Peru

SUM TOTAL: Cuzco - High Altitude Area with-
out Flocks - 1966

Hours Spent = $5\frac{1}{2}$

Average no. inds. seen per hour = 2.0

Average no. inds. seen in flocks per hour = 0

Inds. seen in flocks as % total inds. = 0%

Average no. flocks seen per hour = 0

Average no. highly organized flocks per hour = 0

Average no. inds. per flock = 0

Largest no. inds. in one flock = 0

Average no. species per flock = 0

Largest no. species in one flock = 0

Extreme North Peru

(12)

SUM TOTAL : Cutover - Areas where Flocks Occur -
1966.

Hours Spent = 17

Average no. inds. seen per hour = 6.41

Average no. inds. seen in flocks per hour = 3.94

Inds. seen in flocks as % total inds. = 61.47 %

Average no. flocks seen per hour = 0.76

Average no. highly organized flocks per hour = 0.47

Average no. inds. per flock = 5.15

Largest no. inds. one flock = 13

Average no. species per flock = 3.62

Largest no. species in one flock = 8

Central Ecuador

(13)

SUM TOTAL: All areas apparently suitable for flocks - 1964 and 1966.

Hours Spent = 111

Average no. inds. seen per hour = 11.96

Average no. inds. seen in flocks per hour = 4.35

Inds. seen in flocks as % total inds. = 36.37 %

Average no. flocks seen per hour = 0.80

Average no. highly organized flocks per hour = 0.31

Average no. inds. per flock = 5.43

Largest no. inds. in one flock = 17

Average no. species per flock = 3.38

Largest no. species in one flock = 10

Central Ecuador
from Total Areas apparently suitable for flocks
in which highly organized flocks were seen - 1966

(14)

Hours spent = $62\frac{3}{4}$

Average no. inds seen per hour = 14.49

Average no. inds seen in flocks per hour = 6.96

Inds. seen in flocks as % total inds = 48.07 %

Average no. flocks seen per hour = 1.16

Average no. highly organized flocks per hour = 0.54

Average no. inds per flock = 5.99

Largest no. inds in one flock = 17

Average no. species per flock = 3.66

Largest no. species one flock = 10

Central Ecuador

Scanned Total Areas apparently suitable for flocks
But in which highly organized flocks were
not seen - 1964 + 1966

(13)

Hours spent = 48 $\frac{1}{4}$

Average no. inds. seen per hour = 8.69

Average no. inds. seen in flocks per hour = 0.95

Inds. seen in flocks as % total inds. = 12.33 %

Average no. flocks seen per hour = 0.33

Average no. highly organized flocks per hour = 0

Average no. inds. per flock = 2.875

Largest no. inds. in one flock = 4

Average no. species per flock = 2.125

Largest no. species in one flock = 3

Central Ecuador
9700 - 9300 ft level (below San Juan)
March 13, 14, 18, 20, 24 — 1966
2957 - 2835 m

(10)

Hours Spent = 14

Average no. inds seen per hour = 17.21

Average no. inds seen in flocks per hour = 8.86

Inds seen in flocks as % total inds = 51.45 %

Average no. flocks seen per hour = 1.50

Average no. highly organized flocks per hour = 0.64

Average no. inds. per flock = 5.90

Largest no. inds in one flock = 15

Average no. species per flock = 3.67

Largest no. species in one flock = 10

Central Ecuador

9200 - 8800 ft level (below San Juan)

March 20, 21, 22, 23 - 1966

2803 - 2683 m

(14)

Hours Spent = 14 1/2

Average no. inds. seen per hour = 15.03

Average no. inds. seen in flocks per hour = 8.62

Inds. seen in flocks as % total inds. = 57.34 %

Average no. flocks seen per hour = 1.31

Average no. highly organized flocks per hour = 0.41

Average no. inds. per flock = 6.58

Largest no. inds. in one flock = 17

Average no. species per flock = 4.0

Largest no. species in one flock = 10

$$1 \text{ ft} = 0.305 \text{ m. } 39.37 \text{ inches}$$

$$3.281 \text{ ft} = 1 \text{ m}$$

Santa Marta

SUM TOTAL San Lorenzo - August 1967

Hours spent = $33\frac{3}{4}$ (All in areas with large and/or highly organized flocks.)

Average number inds. seen per hour = 9.36

Average no. inds. seen in flocks per hour = 6.49

Inds seen in flocks as % total inds. = 69.08 %

Average no. flocks seen per hour = 0.83

Average no. highly organized flocks per hour = 0.44

Average no. inds. per flock = 7.82

Largest no. inds. in one flock = 32 (Chlorophanes)

Average no. species per flock = 4.43

Largest no. species in one flock = 14

Sierra de Mérida

SUM TOTAL: Pico Espejo (Stations 1+2) - April 1965

Hours Spent = 23

Average no. inds. seen per hour = 9.48

Average no. inds. seen in flocks per hour = 4.08

Inds. seen in flocks as % total inds. = 43.12%

Average no. flocks seen per hour = 0.74

Average no. highly organized flocks per hour = 0.35

Average no. inds. per flock = 5.53

Largest no. inds one flock = 16

Average no. species per flock = 4.06

Largest no. species in one flock = 11

Sierra de Menda

SUM TOTAL: Pico Espejo (Stations 1 & 2) - Aug, Sept, 1965

Hours spent = $14\frac{1}{2}$

Average no. inds seen per hour = 9.17

Average no. inds seen in flocks per hour = 7.24

Inds. seen in flocks as % total inds. = 78.95%

Average no. flocks seen per hour = 0.76

Average no. highly organized flocks per hour = 0.76

Average no. inds. per flock = 9.55

Largest no. inds one flock = 22

Average no. species per flock = 5.91

Largest no. species in one flock = 15

Sierra de Merula

SUM TOTAL: Páramo La Negra - April, 1965

Hours Spent: $9\frac{3}{4}$

Average no. inds. seen per hour = 8.31

Average no. inds. seen in flocks per hour = 2.87

Inds. seen in flocks as % total inds = 34.57%

Average no. flocks seen per hour = 0.61

Average no. highly organized flocks per hour = 0.31

Average no. inds. per flock = 4.67

Largest no. inds. in one flock = 6

Average no. species per flock = 2

Largest no. species in one flock = 2

Sección de Memorias

SUM TOTAL = Panamá La Vieja - Aug. + Sept., 1948

Hours Spent = $11\frac{1}{2}$

Average no. inds. seen per hour = 13.04

Average no. inds. seen in flocks per hour = 5.91

Inds. seen in flocks as % total inds. = 45.34 %

Average no. flocks seen per hour = 0.96

Average no. highly organized flocks per hour = 0.35

Average no. inds per flock = 6.18

Largest no. inds. in one flock = 15

Average no. species per flock = 3.25

Largest no. species in one flock = 8

Sierra de Múrida

SUM TOTAL: Paramo Zumbador - Sept. 1965

Hours spent = $8\frac{1}{4}$

Average no. inds seen per hour = 18.06

Average no. inds seen in flocks per hour = 15.03

Inds. seen in flocks as % total inds = 83.22 %

Average no. flocks seen per hour = 1.09

Average no. highly organized flocks per hour = 1.09

Average no. inds. per flock = 13.178

Largest no. inds. in one flock = 22

Average no. species per flock = 7.617

Largest no. species in one flock = 11

Eastern Ceryle Colombia

SUM TOTAL: Panamá de Guasca - September, 1962.

Hours Spent: $10 \frac{3}{4}$

Average no. inds. seen per hour = 6.79

Average no. inds. seen in flocks per hour = 3.26

Inds. seen in flocks as % total inds. = 47.95%

Average no. flocks seen per hour = 0.34

Average no. highly organized flocks seen per hour = 0.28

Average no. inds. per flock = 8.75

Largest no. inds. in one flock = 16

Average no. species per flock = 5.50

Largest no. species one flock = 9

Eastern Cordillera Colombia

SUM TOTAL. Períamo de Guasca - April, 1963

Hours spent = $13\frac{1}{2}$

Average no. inds. seen per hour = 12.81

Average no. inds seen in flocks per hour = 4.81

Inds. seen in flocks as % total inds. = 37.51%

Average no. of flocks seen per hour = 0.175

Average no highly organized flocks seen per hour = 0.30

Average no. inds per flock = 6.5

Largest no. inds in one flock = 12

Average no. species per flock = 4.1

Largest no. of species in one flock = 6

Eastern Cordillera, Colombia

SUM TOTAL Paramo de Guasca - August, 1965

Hours spent: $7\frac{1}{4}$

Average no. inds. seen per hour: 10.48

Average no. inds. seen in flocks per hour: 2.07

Inds. seen in flocks as % total inds. = 19.74%

Average no. of flocks seen per hour = 0.41

Average no. highly organized flocks seen per hour = 0.14

Average no. inds. per flock = 5

Largest no. inds. in one flock = 8

Average no. of species per flock = 4.33

Largest no. of species in one flock = 7

Eastern Cordillera Colombia

✓

SUM TOTAL Mts above Bogotá - April, 1965

Hours spent = $21 \frac{3}{4}$

Average no. inds seen per hour = 9.22

Average no. inds seen in flocks per hour = 2.25

Inds seen in flocks as % total inds = 24.26%

Average no. flocks seen per hour = 0.59

Average no. highly organized flocks per hour = 0.14

Average no. inds. per flock = 3.77

Largest no. inds. in one flock = 17

Average no. species per flock = 2.77

Largest no. of species in one flock = 5

Eastern Cordillera Colombia

SUM TOTAL. Mts. above Bogotá - August, 1965

Hours Spent = $11\frac{1}{2}$

Average no. inds seen per hour = 12.00

Average no. of inds. seen in flocks per hour = 4.52

Inds. seen in flocks as % total inds = 36.96 %

Average no. flocks seen per hour = 0.817

Average no. highly organized flocks seen per hour = 0.52

Average no. inds. per flock = 5.1

Largest no. inds. in one flock = 12

Average no. species per flock = 3.30

Largest no. of species in one flock = 8

Eastern Cordillera Colombia

SUM TOTAL

Agua Bonita - April, 1965

Hours Spent = $8\frac{1}{4}$

Average no. inds. seen per hour = 8.24

Average no. inds. seen in flocks per hour = 4.97

Inds. seen in flocks as % total inds. = 60.27%

Average no. of flocks seen per hour = 0.36

Average no. highly organized flocks per hour = 0.36

Average no. inds. per flock = 13.67

Largest no. inds. in one flock = 26

Average no. species per flock = 8.67

Largest no. species in one flock = 15

Eastern Cordillera Colombia

SUM TOTAL Agua Bonita - August, 1965

Hours spent = 13

Average no. inds. seen per hour = 13.23

Average no. inds. seen in flocks per hour = 9.31

Inds. seen in flocks as % total inds. = 70.39 %

Average no. of flocks seen per hour = 1.23

Average no. highly organized flocks per hour = 0.85

Average no. inds. per flock = 17.56

Largest no. inds. in one flock = 19

Average no. species in one flock = 4.50

Largest no. species in one flock = 11

SUM TOTAL: Purace' - Town Side + Top - May, 1965

Hours Spent = $49 \frac{3}{4}$

Average number inds. seen per hour = 8.56

Average no. inds. seen in flocks per hour = 4.02

Inds. seen in flocks as % total inds. = 46.95%

Average no. flocks seen per hour = 0.68

Average no. highly organized flocks per hour = 0.42

Average no. inds. per flock = 5.88

Largest no. inds. one flock = 18

Average no. species per flock = 3.91

Largest no. species in one flock = 10

SUM TOTAL: Puraca - Town Side & Top - August, 1965

Hours Spent = 17

Average no. inds. seen per hour = 9.71

Average no. inds. seen in flocks per hour = 7.14

Inds. seen in flocks as % total inds. = 73.33 %

Average no. flocks seen per hour = 0.57

Average no. highly organized flocks per hour = 0.57

Average no. inds. per flock = 12.50

Largest no. inds. one flock = 22

Average no. species per flock = 8.25

Largest no. species in one flock = 13

Int. Figures

SUM TOTAL: Purace - Moscopán side - May, 1965

Hours spent = $19\frac{3}{4}$

Average number inds. seen per hour = 11.90

Average no. inds. seen in flocks per hour = 10.49

Inds. seen in flocks as % total inds. = 90.64%

Average no. flocks seen per hour = 0.91

Average no. highly organized flocks per hour = 0.81

Average no. inds. per flock = 11.83

Largest no. inds. in one flock = 28

Average no. species per flock = 7.22

Largest no. species one flock = 16

Not Tijeras

SUM TOTAL: Purace' - Moscopán Side - August, 1965.

Hours Spent = 13

Average number inds. seen per hour = 17.77

Average no. inds. seen in flocks per hour = 16.38

Inds. seen in flocks as % total inds. = 92.21 %

Average no. flocks seen per hour = 1.08

Average no. highly organized flocks seen per hour = 1.08

Average no. inds. per flock = 15.215

Largest no. inds. in one flock = 35

Average no. species per flock = 9.36

Largest no. species on flock = 28

Central Cordillera, Colombia

(35)

Medellin area: Páramo Blancos,
Santa Elena, Boqueron de Palmitas,
La Montaña, Belmira, etc.

SUM TOTAL

July 1965

Hours Spent = 23½

Average number inds. seen per hour = 8.36

Average number inds. seen in flocks per hour = 4.85

Inds. seen in flocks as % total inds. = 58.16 %

Average no. flocks seen per hour = 0.64

Average no. highly organized flocks per hour = 0.35

Average no. inds. per flock = 7.60

Largest no. inds. one flock = 20

Average no. species in one flock = 3.0

Largest no. species in one flock = 16

SUM TOTAL: Munchique - May, 1965

Hours Spent = 29 1/4

Average number inds. seen per hour = 8.85

Average no. inds. seen in flocks per hour = 5.47

Inds. seen in flocks as % total inds. = 61.78 %

Average no. flocks seen per hour = 0.172

Average no. highly organized flocks per hour = 0.48

Average no. inds. per flock = 17.62

Largest no. inds. in one flock = 18

Average no. species per flock = 4.57

Largest no. species in one flock = 13

Western Cordillera Colombia

(34)

SUM TOTAL: Munchique - August, 1965

Hours spent = 18

Average no. inds. seen per hour = 10.06

Average no. inds. seen in flocks per hour = 8.56

Inds. seen in flocks as % total inds. = 85.08 %

Average no. flocks seen per hour = 0.61

Average no. highly organized flocks per hour = 0.56

Average no. inds. per flock = 14.0

Largest no. inds. in one flock = 37

Average no. species per flock = 7.82

Largest no. species in one flock = 19

Western Cordillera Colombia

(38)

SUM TOTAL: San Gerardo (La Palma) - August, 1965

Hours spent = $9\frac{1}{4}$

Average no. inds. seen per hour = 8.32

Average no. inds. seen in flocks per hour = 5.07

Inds. seen in flocks as % total inds. = 61.04%

Average no. flocks seen per hour = 0.54

Average no. highly organized flocks per hour = 0.32

Average no. inds. per flock = 9.40

Largest no. inds. in one flock = 20

Average no. species per flock = 5.0

Largest no. species in one flock = 10

SUM TOTAL: La Carpientería - (L. Farm) - April, May, 1965

Hours Spent = 20 1/2

Average no. inds. seen per hour = 8.15

Average no. inds. seen in flocks per hour = 6.88

Inds. seen in flocks as % total inds. = 84.43%

Average no. flocks seen per hour = 0.68

Average no. highly organized flocks per hour = 0.68

Average no. inds. per flock = 10.08

Largest no. inds. in one flock = 20

Average no. species per flock = 6.15

Largest no. species one flock = 13

Western Cordillera Colombia

(40)

SUM TOTAL: La Carpientería. August, 1965.

Hours spent: $14\frac{1}{2}$ (Over 5 days; all p.m.)

Average no. inds. seen per hour = 11.17

Average no. inds. seen in flocks per hour = 10.76

Inds. seen in flocks as % total inds. = 96.29%

Average no. flocks seen per hour = 1.10

Average no. highly organized flocks per hour = 1.04

Average no. inds. per flock = 9.75

Largest no. inds. in one flock = 21

Average no. species per flock = 6.81

Largest no. species one flock = 15

SUM TOTAL: Farallones - May, 1965

Hours spent = $17\frac{1}{2}$

Average no. inds. seen per hour = 14.40

Average no. inds. seen in flocks per hour = 11.49

Inds. seen in flocks as % total inds. = 79.76%

Average no. flocks seen per hour = 1.26

Average no. highly organized flocks per hour = 0.91

Average no. inds. per flock = 9.14

Largest no. inds. in one flock = 20

Average no. species per flock = 6.0

Largest no. species in one flock = 13

SUM TOTAL Northern Part of Western Cordillera of
Colombia - July 1965

Hours Spent = 28 (All in areas with large and/or
highly organized flocks)

Average number ind. seen per hour = 10.61

Average no. inds. seen in flocks per hour = 7.78

Inds. seen in flocks as % total inds. = 73.40%

Average no. flocks seen per hour = 0.36

Average no. highly organized flock per hour = 0.32

Average no. inds. per flock = 9.08

Largest no. inds. in one flock = 24

Average no. species per flock = 5.21
(based on 19 flocks)

Largest no. species in one flock = 14